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| 09/893,965 | 06/29/2001 | Jeong Hyun Kim | 8733.472.00 | 6105 |
| 30827 | 7590 | 11/04/2004 | EXAMINER | |
| MCKENNA LONG & ALDRIDGE LLP | | | ORTIZ, EDGARDO | |
| 1900 K STREET, NW | | | ART UNIT | |
| WASHINGTON, DC 20006 | | | PAPER NUMBER | |
| | | | 2815 | |

DATE MAILED: 11/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/893,965

Applicant(s)

KIM ET AL.

Examiner

Edgardo Ortiz

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1 The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 6-8 and 12-17 are rejected under 35 § U.S.C. 103 (a) as being unpatentable over Applicant's admitted prior art figures 1-2E, and their description on pages 2-4 of the instant application, in view of AGFA (PEDOT Coating Solutions and Screen Printing Pastes Product in Development). With regard to Claim 1, Applicant's admitted prior art teaches a first substrate (21), a second substrate (21a) adjacent the first substrate, a plurality of crossing gate lines and data lines (page 2, paragraph 0005, lines 3-5), formed on the first substrate and inherently including gate and data pads for interconnection to external driving circuitry, a plurality of switching elements (25a-d) arranged on the first substrate, a plurality of pixel electrodes (29) on the first substrate and a liquid crystal layer (23) interposed between the first and second substrates.

However, Applicant's admitted prior art fails to teach an organic conductive layer on each of the gate and data pads on the first substrate and that the pixel electrodes comprise organic material. AGFA discloses a transparent conductive polymer (PEDOT), which has very good adhesion to substrates and increases transparency and conductivity (column 2, lines 16-25) and which can be used for the material for transparent electrodes in thin film

Art Unit: 2815

transistors (column 2, line 32). Therefore, it would have been an obvious modification to someone with ordinary skill in the art, at the time of the invention, to modify the structure as taught by Applicant's admitted prior art to include an organic conductive layer on each of the gate and data pads on the first substrate and pixels electrode comprising organic material, as suggested by AGFA, in order to increase transparency and conductivity (column 2, lines 20-22).

With regard to Claims 2 and 3, a further difference between Applicant's admitted prior art and the claimed invention is, an organic pixel electrode including an organic polymer and comprising PEDOT. AGFA discloses a transparent conductive polymer (PEDOT), which can be used as the material for transparent electrodes in thin film transistors (column 2, line 32). Therefore, it would have been an obvious modification to someone with ordinary skill in the art, at the time of the invention, to modify the structure as taught by Applicant's admitted prior art to include an organic pixel electrode including an organic polymer and comprising PEDOT, as suggested by AGFA, in order increase transparency and conductivity (column 2, lines 20-22)

With regard to Claim 4, Applicant's admitted prior art teaches switching elements (25a-d), which include thin film transistors (TFT).

With regard to Claim 6, Applicant's admitted prior art teaches a gate electrode (25a), crossing gate lines (page 2, paragraph 0005, lines 3-5) which inherently include a gate

Art Unit: 2815

pad for interconnection to external driving circuitry, a gate insulating layer (25b) over the gate electrode, a semiconductor layer (25c) on the gate insulating layer and over the gate electrode, and source and drain electrodes (25d, 25e) on the semiconductor layer.

However, Applicant's admitted prior art fails to teach an organic conductive layer on the gate pad. AGFA discloses a transparent conductive polymer (PEDOT), which has very good adhesion to substrates and increases transparency and conductivity (column 2, lines 16-25). Therefore, it would have been an obvious modification to someone with ordinary skill in the art, at the time of the invention, to modify the structure as taught by Applicant's admitted prior art to include an organic conductive layer on the gate pad, as suggested by AGFA, in order to increase transparency and conductivity (column 2, lines 20-22).

With regard to Claim 7, Applicant's admitted prior art teaches pixel electrodes (29) connected to drain electrodes (25e).

With regard to Claim 8, Applicant's admitted prior art teaches a passivation layer (27) over the plurality of switching elements (25a-d) and over the first substrate (21).

With regard to Claim 12, Applicant's admitted prior art teaches a passivation layer (27) which includes an inorganic material (silicon nitride, silicon oxide, BCB).

With regard to Claim 13, Applicant's admitted prior art teaches a substrate (21) having an

Art Unit: 2815

active area defined by source and drain electrodes (25d, 25e) and a pad area which includes a gate line and a crossing line (page 2, paragraph 0005, lines 3-5), a thin film transistor (TFT) at a crossing between the gate and data lines (page 2, paragraph 0005, lines 4-5), a passivation layer (27) over the thin film transistor, wherein the passivation layer includes a contact hole (page 4, paragraph 0011, lines 3-5) and a pixel electrode (29) formed in the active area, wherein the pixel electrode connects to the thin film transistor through the contact hole.

However, Applicant's admitted prior art fails to teach an organic conductive layer on the pad area. AGFA discloses a transparent conductive polymer (PEDOT), which has very good adhesion to substrates and increases transparency and conductivity (column 2, lines 16-25). Therefore, it would have been an obvious modification to someone with ordinary skill in the art, at the time of the invention, to modify the structure as taught by Applicant's admitted prior art to include an organic conductive layer on the gate pad, as suggested by AGFA, in order to increase transparency and conductivity (column 2, lines 20-22).

With regard to Claims 14 and 15, a further difference between Applicant's admitted prior art and the claimed invention is, an organic pixel electrode including an organic polymer and comprising PEDOT. AGFA discloses a transparent conductive polymer (PEDOT), which can be used as the material for transparent electrodes in thin film transistors (column 2, line 32). Therefore, it would have been an obvious modification to someone with ordinary skill in the art, at the time of the invention, to modify the structure as taught

by Applicant's admitted prior art to include an organic pixel electrode including an organic polymer and comprising PEDOT, as suggested by AGFA, in order increase transparency and conductivity (column 2, lines 20-22).

With regard to Claim 16, a further difference between the claimed invention and Applicant's admitted prior art is, an organic pixel electrode that is electrically-conductive. AGFA discloses a transparent conductive polymer (PEDOT), which can be used as the material for transparent electrodes in thin film transistors (column 2, line 32). Therefore, it would have been an obvious modification to someone with ordinary skill in the art, at the time of the invention, to modify the structure as taught by Applicant's admitted prior art to include an organic pixel electrode that is electrically conductive, as suggested by AGFA, in order increase transparency and conductivity (column 2, lines 20-22).

With regard to Claim 17, Applicant's admitted prior art teaches a pixel electrode (29) that is in an area bounded by gate and data lines. However, Applicant's admitted prior art fails to teach it is an organic pixel electrode. AGFA discloses a transparent conductive polymer (PEDOT) which can be used as the material for transparent electrodes in thin film transistors. Therefore, it would have been an obvious modification to someone with ordinary skill in the art, at the time of the invention, to modify the structure as taught by Applicant's admitted prior art to include an organic pixel electrode that is in a pixel area, as suggested by AGFA, in order increase transparency and conductivity (column 2, lines 20-22).

Art Unit: 2815

2. Claims 5 and 9-11 are rejected under 35 U.S.C. § 103 (a) as being unpatentable over Applicant's admitted prior art figures 1-2E, and their description on pages 2-4 of the instant application, in view of AGFA (PEDOT Coating Solutions and Screen Printing Pastes Product in development) and further in view of Kim et al. (U.S. Patent No. 6,038,008). With regard to Claim 5, Applicant's admitted prior art and AGFA, as stated supra, essentially disclose the claimed invention but fail to show, that the thin film transistors are amorphous thin film transistors. Kim discloses a liquid crystal display device which includes an amorphous silicon (a-Si) film (122) as part of a TFT, see column 4, line 41. Therefore, it would have been an obvious modification to someone with ordinary skill in the art, at the time of the invention, to modify the structure as taught by the teachings of Applicant's admitted prior art and AGFA to include amorphous thin film transistors as part of the device, as suggested by Kim, in order to provide transistors having a material known in the liquid crystal display art for its lower interface density.

With regard to Claims 9-11, a further difference between the claimed invention and Applicant's admitted prior art and AGFA is, passivation layer including an organic material, wherein the organic material includes BCB or acryl. Kim discloses a liquid crystal display device, which includes a passivation layer (126) that is made of an organic material and which includes BCB or acryl (column 4, lines 60-67). Therefore, it would have been an obvious modification to someone with ordinary skill in the art, at the time of the invention, to modify the structure as taught by the teachings of Applicant's

Art Unit: 2815

admitted prior art and AGFA to include passivation layer including an organic material, wherein the organic material includes BCB or acryl, as suggested by Kim, in order to provide a passivation layer including a material which reduces leakage current and cross-talks because of its low dielectric constant (column 6, lines 63-66).

Response to Arguments

3. Applicant's arguments have been fully considered but they are not persuasive. Applicant argues that, *"AGFA does not suggest at all that PEDOT is suitable for use in liquid crystal displays such as those of the present application."* However, the examiner disagrees and notes that AGFA discloses a transparent conductive polymer (PEDOT) and suggests that PEDOT can be used as the material for transparent electrodes in thin film transistors. For the reasons stated above, the claimed invention does not structurally or patentably distinguish over the cited prior art and the rejection is maintained.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edgardo Ortiz whose telephone number is 571-272-1735. The examiner can normally be reached on Monday-Friday (1st Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 571-272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2815

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to be "E.O. A.U. 2815", written over the typed name and unit number.

E.O.
A.U. 2815
10/30/04